

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***  
Title V draft permit, No. V-04-050  
**OWENSBORO MUNICIPAL UTILITIES**  
**ELMER SMITH GENERATING STATION**

Owensboro, KY 42302

January 12, 2006

Herbert R. Campbell/Martha M. Allman, Reviewers

SOURCE I.D. #: 21-059-00027

SOURCE A.I. #: 942

ACTIVITY #: APE20040001

**SOURCE DESCRIPTION:**

An application was received on March 31, 2004 for a renewal to the Title V Permit, V-97-011, for the Owensboro Municipal Utilities (OMU) Elmer Smith Generating Station. The submittal included a nitrogen oxides (NO<sub>x</sub>) Budget Permit application and a Compliance Assurance Monitoring (CAM) plan. The new Title V permit will include a renewal of the Phase II Acid Rain Permit and the NO<sub>x</sub> Budget Permit. A revised CAM plan dated July 27, 2005 was received on July 29, 2005, and portions of that plan have been incorporated in the renewal permit.

OMU is an electric power generating plant that has two coal-fired boilers and an oil-fired heating boiler. In addition, the facility includes ash, coal and limestone related equipment. The coal-fired boilers have input ratings of 1507 mmBtu/hour (Unit 1) and 2566 mmBtu/hour (Unit 2). Since the initial Title V permit was issued, OMU has added an Overfire Air System and Selective Catalytic Reduction to Unit 1. A low NO<sub>x</sub> burner, Separated Overfire Air System, and Selective Noncatalytic Reduction have been added to Unit 2. An existing FGD system are shared by the two units for SO<sub>2</sub> control and the SO<sub>2</sub> Continuous Emission Monitoring System (CEMS) is located in a common stack.

A bypass chimney had been used to direct flue gas around the FGD system, but the bypass stack dampers have been disabled and permanently blocked off. Each unit is equipped with an electrostatic precipitator and each unit has a dedicated NO<sub>x</sub> CEMS located in the duct at the outlet of the units' ESP. Opacity is measured continuously in the common FGD inlet duct.

The following is a list of significant emission units (EU).

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|-------|---|
| EU 01 | (Unit 1) 1507 mmBtu/hour cyclone furnace coal-fired, indirect heat exchanger unit equipped with overfire air, electrostatic precipitator, selective catalytic reduction and flue gas desulfurization; construction commenced before 1964.   |
| EU 02 | (Unit 2) 2566 mmBtu/hour pulverized coal, tangentially-fired, dry bottom, indirect heat exchanger unit equipped with low NO <sub>x</sub> burners and separated overfire air, electrostatic precipitator, selective non-catalytic reduction, and flue gas desulfurization; construction commenced before 1974. |
| EU 03 | 8.3 mmBtu/hour tangentially-fired fuel oil (No. 2) indirect heat exchanger unit; construction commenced before 1964.  |
| EU 04 | Ash Handling: Number 2 Ash Silo; Silo vent and air receiver/separator equipped with particulate bag-filters, constructed before 1993.   |

- EU 05      Ash Handling: Number 1 Ash Silo; Silo vent and air receiver/separator equipped with particulate bag-filters, constructed before 1964.
- EU 06      Limestone Handling and Processing: 48 inch belt conveyor with two transfer points (hopper to 48 inch belt conveyor and 48 inch belt conveyor to 24 inch belt conveyor), and 24 inch belt conveyor (equipped with enclosures) with one transfer point @ 24 inch belt conveyor to silo (equipped with insertable dust filters). Construction commenced before 1993.
- EU 07      Limestone Crushing: Two limestone ball mills; construction commenced before 1993.
- EU 08      Limestone Conveying and Handling: Limestone truck/reclaim hopper (equipped with enclosures), haul roads (equipped with wet suppression equipment), and stockpiles (equipped with suppression equipment); construction commenced before 1993.
- EU 09      Coal Conveying and Handling Equipment includes: Conveyors (equipped with enclosures), scales (equipped with enclosures), crushers (equipped with enclosures), stockpiles (equipped with suppression equipment), and haul roads (equipped with suppression equipment); construction commenced before 1964.

## **REGULATION APPLICABILITY:**

### Emissions Unit 01 (Unit 1): Coal-Fired Indirect Heat Exchanger, 1507 mmBtu/hr

Unit 1 is a Babcock & Wilcox cyclone furnace coal-fired boiler and was installed in 1964. The unit has a maximum fuel input capacity of 1507 mmBtu/hour. The primary fuel burned is coal, with shot coke and sponge coke (30% mixture of either with coal) as secondary fuels and a 10% mixture of tire derived fuel (TDF) and coal as tertiary fuel. The unit is equipped with pollution controls including overfire air, electrostatic precipitator, a selective catalytic reduction and flue gas desulfurization.

The following regulations are applicable to the unit:

- 401 KAR 52:060      Acid rain permits;
- 401 KAR 51:160      NO<sub>x</sub> requirements for large utility and industrial boilers;
- 401 KAR 61:015      Existing indirect heat exchangers, applicable to an emission unit with a capacity of more than 250 mmBtu/hr and commenced before August 17, 1971.
- 40 CFR Part 64      Compliance Assurance Monitoring (for SO<sub>2</sub> & PM/Opacity)

401 KAR 52:060, Acid rain permits, applies to Unit 1 for the prevention, abatement, and control of air pollution and incorporates by reference the federal acid rain provisions as codified in 40 CFR Parts 72 to 78.

401 KAR 51:160, NO<sub>x</sub> requirements for large utility and industrial boilers, and 40 CFR Part 96, NO<sub>x</sub> Budget Trading Program for State Implementation Plans, apply to this unit. The NO<sub>x</sub> Budget Permit application for this unit was submitted to the Division, and received on August 1, 2003. Requirements contained in that application were incorporated into and made part of the NO<sub>x</sub> Budget Permit. Pursuant to 401 KAR 52:020, Section 3, the source shall operate in compliance with those requirements.

Pursuant to 40 CFR 76.6(a)(2), this unit is not subject to a NO<sub>x</sub> limitation since the Maximum Continuous Steam Flow at 100% load is less than 1060 thousands of lb/hour. Pursuant to 40 CFR 96.4(a), the unit is a NO<sub>x</sub> Budget unit, and hence, is required to comply with 40 CFR Part 75, Subpart H, which requires continuous emission monitoring of NO<sub>x</sub>. However, since there is no NO<sub>x</sub> limitation for this unit, 40 CFR 64, Compliance Assurance Monitoring (CAM), does not apply to NO<sub>x</sub> for this unit.

Pursuant to 401 KAR 61:015, Section 5, emissions of sulfur dioxide (SO<sub>2</sub>) shall not exceed 6 lb/mmBtu based on a 24-hour average. The unit has SO<sub>2</sub> allowances as listed in 40 CFR 73.10 of 2804 allowances per year through the year 2009, then 2810 allowances per year beginning in the year 2010. Pursuant to 401 KAR 61:005, Section 3 and 40 CFR Part 75, a continuous emission monitoring system (CEMS) of sulfur dioxide is required. As there is both an emission limitation and a control device associated with sulfur dioxide, 40 CFR Part 64, Compliance Assurance Monitoring (CAM) applies. As CEMS is required pursuant to 40 CFR Part 75, 40 CFR 64.3(d) requires that the CEMS be used to satisfy CAM requirements as well.

Pursuant to 401 KAR 61:015, Section 4(2), opacity shall not exceed 20 percent based on a six-minute average except that a maximum of 40 percent opacity is allowed for a period or aggregate of periods not more than six consecutive minutes in any sixty minutes, except under conditions when building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations. Continuous opacity monitoring is required by 401 KAR 61:005.

Pursuant to 401 KAR 61:015, Section 4(1), the unit shall have emissions of particulate matter (PM) ≤ 0.17 lb/mmBtu based on a 3-hour average. As there is an emission limitation and a control device for particulate matter, 40 CFR Part 64 applies to particulates. Per OMU's CAM plan filed on July 29, 2005, OMU will use opacity as an indicator of the proper operation of the ESP in lieu of a PM CEMS. OMU will conduct tests to determine the relationship between opacity levels and particulate matter.

Pursuant to 401 KAR 61:015, Section 6 (1), the sulfur content of solid fuels, as burned shall be determined in accordance with methods specified by the Division.

Pursuant to 401 KAR 61:015, Section 6 (3), the rate of each fuel burned shall be measured and recorded daily. The heating value and ash content of fuels shall be ascertained at least once per week and recorded. The average electrical output, and the minimum and maximum hourly generation rate shall be measured and recorded daily.

Emissions Unit 2 (Unit 2) Coal-Fired Indirect Heat Exchanger, 2566.4 mmBtu/hr

Unit 2 is a Combustion Engineering tangentially fired steam (pulverized coal, dry bottom) boiler and construction commenced in 1971. The unit has a maximum fuel input capacity of 2675 mmBtu/hour. The primary fuel is coal, with sponge coke mixed with coal as a secondary fuel. The unit is equipped with pollution controls including low NO<sub>x</sub> burners and separated overfire air, electrostatic precipitator, selective non-catalytic reduction, and flue gas desulfurization.

The following regulations are applicable to the unit:

401 KAR 52:060      Acid rain permits;

401 KAR 51:160      NO<sub>x</sub> requirements for large utility and industrial boilers;

401 KAR 61:015      Existing indirect heat exchangers, applicable to an emission unit with a capacity of more than 250 mmBtu/hr and commenced before August 17, 1971.

40 CFR, Part 64      Compliance Assurance Monitoring (for NO<sub>x</sub>, SO<sub>2</sub> & PM/Opacity)

401 KAR 52:060, Acid rain permits, applies to Unit 2 for the prevention, abatement, and control of air pollution and incorporates by reference the federal acid rain provisions as codified in 40 CFR Parts 72 to 78. The NO<sub>x</sub> limit and the averaging plans are set by 40 CFR 75 and 76.

401 KAR 51:160, NO<sub>x</sub> requirements for large utility and industrial boilers, and 40 CFR Part 96 , NO<sub>x</sub> Budget Trading Program for State Implementation Plans, apply to this unit. The NO<sub>x</sub> Budget Permit application for this unit was submitted to the Division, and received on August 1, 2003. Requirements contained in that application were incorporated into and made part of the NO<sub>x</sub> Budget Permit. Pursuant to 401 KAR 52:020, Section 3, the source shall operate in compliance with those requirements. Pursuant to 401 KAR 61:005, Section 3 and 40 CFR Part 75, continuous emission monitoring of nitrogen oxides is required. As Unit 2 has a NO<sub>x</sub> limit and a control device for NO<sub>x</sub>, 40 CFR Part 64, Compliance Assurance Monitoring, applies to this unit. As CEMS is required pursuant to 40 CFR Part 75, 40 CFR 64.3.(d) requires that the CEMS be used to satisfy CAM requirements as well.

Pursuant to 401 KAR 61:015, Section 5, emissions of SO<sub>2</sub> shall not exceed 6 lb/mmBtu based on a 24-hour average. The unit has SO<sub>2</sub> allowances as listed in 40 CFR 73.10 of 6211 allowances per year through the year 2009, then 6224 allowances per year beginning in the year 2010. Pursuant to 401 KAR 61:005, Section 3 and 40 CFR Part 75, continuous emission monitoring of sulfur dioxide is required. As there is both an emission limitation and a control device associated with sulfur dioxide, 40 CFR Part 64, Compliance Assurance Monitoring (CAM) applies. Pursuant to 40 CFR 64.3(d), CEMS shall be used to satisfy CAM requirements.

Pursuant to 401 KAR 61:015, Section 4(2), opacity shall not exceed 20 percent based on a six-minute average except that a maximum of 40 percent opacity is allowed for a period or aggregate of

periods not more than six consecutive minutes in any sixty minutes, except under conditions when building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations. Continuous Opacity Monitoring is required by 401 KAR 61:005.

Pursuant to 401 KAR 61:015 Section 4(1), the unit shall have emissions of particulate matter (PM)  $\leq 0.13$  lb/mmBtu based on a 3-hour average. As there is an emission limitation and a control device, 40 CFR Part 64 applies to particulates. Per OMU's CAM plan filed on July 29, 2005, OMU will use opacity as an indicator of the proper operation of the ESP. OMU will conduct tests to determine the relationship between opacity levels and particulate matter.

Pursuant to 401 KAR 61:015, Section 6(1), the sulfur content of solid fuels, as burned shall be determined in accordance with methods specified by the Division.

Pursuant to 401 KAR 61:015, Section 6(3), the rate of each fuel burned shall be measured and recorded daily. The heating value and ash content of fuels shall be ascertained at least once per week and recorded. The average electrical output, and the minimum and maximum hourly generation rate shall be measured and recorded daily.

Emissions Unit 03: #2 Oil-Fired Indirect Heat Exchanger, 8.3 mmBtu/hr

The unit is a #2 fuel oil, tangentially fired auxiliary boiler and was installed in 1964. The unit has a maximum fuel input capacity of 8.3 mmBtu/hour.

The following regulations are applicable to the unit:

401 KAR 61:015      Existing indirect heat exchangers, applicable to an emission unit with a capacity of less than 250 mmBtu/hr and commenced before April 9, 1972.

Pursuant to 401 KAR 61:015, Section 5, emissions of SO<sub>2</sub> shall not exceed 0.25 lb/mmBtu based on a 24-hour average. Compliance with the allowable sulfur dioxide standard may be demonstrated by calculating sulfur dioxide emissions using fuel oil usage rates, fuel analysis, and current AP-42 emission factor information.

Pursuant to 401 KAR 61:015, Section 4(2), opacity emissions shall not exceed 20 percent based on a six-minute average except that a maximum of 40 percent opacity is allowed for a period or aggregate of periods not more than six consecutive minutes in any sixty minutes, except under conditions when building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations. For compliance with the opacity limit, when the unit is in operation, the permittee shall read, weather permitting, the opacity of emissions from the stack using Reference Method 9 once per daylight shift.

Pursuant to 401 KAR 61:015 Section 4(1), the unit shall have emissions of particulate matter (PM)  $\leq 0.13$  lb/mmBtu based on a 3-hour average. Compliance with the allowable particulate matter

standard may be demonstrated by calculating particulate matter emissions using fuel oil usage rates, fuel analysis, and current AP-42 emission factor information.

Pursuant to 401 KAR 61:015, Section 6 (1), the permittee shall monitor the heating value and sulfur content of each type of fuel combusted. The permittee may use certification from the fuel supplier to satisfy this requirement.

Pursuant to 401 KAR 61:015, Section 6 (3), the rate of each fuel burned shall be measured and recorded daily.

Emission Unit 04: Ash Handling: Number 2 Ash Silo

The following regulations are applicable to the unit:

401 KAR 59:010,      New Process Operations applicable to emission units commenced on or after July 2, 1975.

Pursuant to 401 KAR 59:010, Section 3 (1), particulate matter emissions into the open air shall not exceed 20% opacity.

Pursuant to 401 KAR 59:010, Section 3 (2), particulate matter emissions into the open air shall not exceed 29.57 lb/hr. Compliance will be demonstrated from the emission calculation basis and monitoring requirements. Observations and records, if applicable, shall be utilized to document failure to comply.

Emission Unit 05: Ash Handling: Number 1 Ash Silo

The following regulations are applicable to the unit:

401 KAR 61:020,      Existing process operations, for emissions unit commenced before July 2, 1975.

Pursuant to 401 KAR 61:020, Section 3 (1), particulate matter emissions into the open air shall not exceed 40% opacity.

Pursuant to 401 KAR 61:020, Section 3 (2), particulate matter emissions into the open air shall not exceed 29.57 lb/hr. Compliance will be demonstrated from the emission calculation basis and monitoring requirements. Observations and records, if applicable, shall be utilized to document failure to comply.

Emission Unit 06: Limestone Handling and Processing

Emission Unit 07: Limestone Crushing

The following regulations are applicable to the units:

401 KAR 60:670 Standards of performance for nonmetallic mineral processing plants

Compliance will be demonstrated by observations and records, if applicable, shall be utilized to document failure to comply. Otherwise, compliance is assumed when daily observations indicate that the processes and controls are operating normally.

Emission Unit 08 Limestone Conveying and Handling

Emission Unit 09: Coal Conveying and Handling

The following regulations are applicable to the units:

401 KAR 63:010      Fugitive Emissions is applicable to each affected facility which emits or may emit fugitive emissions and is not elsewhere subject to an opacity standard within the administrative regulations of the Division for Air Quality.

Pursuant to 401 KAR 63:010, Section 3, reasonable precautions shall be taken to prevent particulate matter from becoming airborne. Such reasonable precautions shall include, when applicable, but not be limited to the following:

1. Application and maintenance of asphalt, application of oil, water, or suitable chemicals on roads, material stockpiles, and other surfaces which can create airborne dusts;
2. Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials, or the use of water sprays or other measures to suppress the dust emissions during handling;

Pursuant to 401 KAR 63:010, Section 3, discharge of visible fugitive dust emissions beyond the property line is prohibited.

The permittee shall monitor the amount of coal and limestone received and processed through each piece of conveying or handling equipment, including stockpiles, on a weekly basis. Visible emissions from each piece of equipment or operation described for this item or group shall be monitored daily during daylight hours to determine whether conditions appear to be normal or abnormal. If the emissions appear to be abnormal, the permittee must then comply with the deviation reporting. The permittee shall maintain records of the amount of coal and limestone received and processed through each piece of conveying or handling equipment, including stockpiles, on a weekly basis.

Regulations not applicable to **Emission Unit 1, 2, and 3** due to applicability date or size of unit:

401 KAR 59:015, New indirect heat exchangers and 401 KAR 60:005 incorporating by reference 40 CFR 60, Subpart D, Standards of performance for fossil-fuel-fired steam generators for which construction is commenced after August 17, 1971.

401 KAR 59:016, New electric utility steam generating units and 401 KAR 60:005 incorporating by reference 40 CFR 60, Subpart Da, Standards of performance for electric utility steam generating units for which construction is commenced after September 18, 1978.

401 KAR 60:005, Standards of performance for industrial-commercial-institutional steam generating units, incorporating by reference 40 CFR 60, Subpart Db, Standards of performance for industrial-commercial-institutional steam generating units.

Regulation not applicable to **Emission Unit 9** (Coal operations) due to definition of affected facility and/or applicability date:

401 KAR 60:005, Standards of performance for coal preparation plants, incorporating by reference 40 CFR 60, Subpart Y, because commenced construction before October 24, 1974.

**Comments:**

- Although OMU described its proposed testing procedures in its CAM plan, this information would be more appropriately filed using the procedures prescribed in 401 KAR 50:045, Performance tests. 40 CFR 64.4(c)(1) requires that “(i)f the applicable rule does not specify testing conditions or only partially specifies test conditions, the performance test generally shall be conducted under conditions representative of maximum emissions potential under anticipated operating conditions at the pollutant-specific emissions unit.” Until more experience is gained with testing to establish the correlation between opacity and particulate emissions, the testing requirements specified in the permit should be flexible enough to accommodate unforeseen conditions while at the same time ensure that the opacity indicator level or range resulting from the tests is an adequate measure of PM compliance.

If five (5) percent of COM data (based on a three-hour rolling average, consistent with the PM emissions limitation) recorded in a calendar quarter show excursions above the indicator range, this would indicate the need to perform a stack test to determine whether or not PM is in compliance while operating at the conditions which resulted in the excursions, to the extent possible. The Division may waive this testing requirement upon a demonstration that the cause of the excursions has been corrected, or may require stack tests at any time pursuant to 401 KAR 50:045, Performance tests.

- Units subject to 401 KAR 60:670, incorporating by reference 40 CFR 60, Subpart OOO, have the periodic monitoring requirement to inspect the control equipment weekly and initiate repairs as necessary to assure compliance. The opacity of emissions must be determined at least annually along with the inspections and necessary repairs of the control equipment.
- Proper operation of the control equipment can assure compliance with the mass particulate standard and opacity standard for units involving limestone, coal or ash handling not mentioned in the lines directly above. Proper operation of the control equipment can be assured by weekly qualitative observation of emissions. If emissions are visible, the permittee shall determine the opacity and initiate an inspection of the control equipment for any necessary repairs.

**OPERATIONAL FLEXIBILITY: N/A**

**EMISSION AND OPERATING CAPS DESCRIPTION:**

Natural gas burners were added as minor modification to EU 002, for additional heat input capability of 780 mmBtu/hr for loss from one pulverizer mill of the unit when a pulverizer mill was out of service in [high year] 2000. This was done to avoid future mega watt-hours lost due to pulverizer outages and to maintain the 23533 MWh (mega watt-hours).

**OPERATING LIMITATION:**

Natural gas may only be fired when one coal pulverizer is out of service. Natural gas shall not run concurrently with the pulverizer, and there will be no increase in heat input rate to the Unit. The amount of natural gas combusted shall be limited to 221 MMSCF to recover the lost heat input from pulverizer mill outages.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

**PAST PERMIT SUMMARY:**

<b>Permit type</b>	<b>Log/ AI #</b>	<b>Complete Date</b>	<b>Issuance Date</b>	<b>Summary of Action</b>
<b>V-97-011 Title V</b>	<b>E934</b>	<b>2/12/1997</b>	<b>9/29/1999</b>	<b>Initial Title V</b>
<b>A-98-003 Acid Rain Permit</b>	<b>50283 (F479)</b>	<b>2/15/1998</b>	<b>3/02/1999</b>	<b>Acid Rain Permit</b>
<b>V-04-050 Title Renewal w/ Acid Rain, NOx Budget</b>	<b>56453/ 942</b>	<b>8/18/2004</b>		<b>Title V Renewal w/ Acid Rain &amp; NOx Budget Permits</b>